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Money, Flexible Prices, and Employment

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#37

MONEY, FLEXIBLE PRICES, AND EMPLOYMENT

By Paul Wells

In a highly valuable article published some 28 years ago, Modigliani reached the rather thundering conclusion that in Kyenes's General Theory "... the consistency of economic equilibrium with the presence of involuntary unemployment... is due entirely to the assumption of 'rigid wages'" [7, p.265]. Now it would not be an exaggeration to say that with this one sweeping conclusion Modigliani effectively jeopardized the entire Keynesian Revolution in economic theory. He jeopardized the revolution by apparently demonstrating for the first time how crucially and how uneasily Keynes's system, in all its uniqueness and all its power, rested on nothing more than a single institutionally valid but theoretically unsatisfactory postulate--the postulate of rigid money wages.

Modigliani produced his extremely damaging result by showing that in a regime of flexible money wages and prices, the economy would move automatically to a position of full employment irrespective of whether one utilized the Keynesian paraphenalia (liquidity preference, consumption function, aggregate demand, etc.) or the more familiar classical paraphenalia (money velocities, "rational" economic behavior, flexible real wages, etc.). He then completed his case by demonstrating that if indeed money wages were rigid, both the Keynesian and classical modes of analysis are equally

capable of grinding out less than full employment equilibriums.

With Modigliani's widely accepted and seemingly inescapable results well in mind, it then comes as somewhat of a shock to reread Chapters 2 and 19 of The General Theory [5] and find Keynes asserting, clearly and uncategorically, that rigid money wages are not responsible for involuntary unemployment, and that a reduction in money wages would have no direct effect on the level of employment. What is so disturbing here is not just that Keynes and Modigliani are in conflict, but that they are in head-on conflict over a fundamental theoretical question; a question moreover which Modigliani seems to have settled so decisively in his 1944 article as to leave no doubts remaining in the minds of most economists as to the unfelicitous role rigid money wages play in aggregate economic theory. Of course Keynes wrote The General Theory well before Modigliani's article appeared, but nevertheless it is unnerving to find the century's leading economist asserting so clearly a proposition so directly at odds with what most economists now believe to be the truth.

Despite the widespread popularity Modigliani's flex price-full employment result now enjoys, this note will present analyses in support of Keynes's two part contention that (a) rigid money wages are not responsible for involuntary unemployment, and (b) far from having a baneful effect on the economy, sticky money wage rates are in fact a necessary and therefore desirable property of any monetary system. Our work begins in Section I with a brief sketch of Modigliani's classical model of the labor market. After

laying bare the assumptions and exposing the innerworkings of his argument, Keynes's objections to the classical theory of employment are then reviewed in Section II. With this done, Section III investigates the efficacy of money wage cuts afresh with the aid of Keynes's own much neglected short run model of The General Theory; the model of aggregate supply and demand developed in Chapter 3 of his book. Finally, Section IV completes the case against flexible prices with a brief discussion supporting Keynes's theoretically fundamental but largely ignored observation that sticky money wages are an essential property of money.

I. Modigliani's Model of the Labor Market

The Modigliani analysis of the labor market assumes competitive behavior, a flexible money wage rate W, and a flexible price per unit of output P. His model consists of the usual three equations; one being a labor demand function, another a labor supply function, and the third a market clearing equation. Letting N_d denote the demand and N_s the supply of labor, the equations of his system are:

(1) $\quad N_d = F(W/P), \quad F' < 0.$

(2) $\quad N_s = G(W/P), \quad G' > 0.$

(3) $\quad N_s = N_d.$

Although equation (3) is familiar to all, it will still be useful to lay out in some detail the vast network of assumptions this simple expression cloaks. Specifically, to assert equation (3) is to assert the following set of statements. If:

(3a) $N_s > N_d$, then $dW < 0$ and $dP \leq 0$, with the provision that $|dW/W| > |dP/P|$ so that $d(W/P) < 0$. Once it is assumed that the real wage rate will fall as a consequence of a decrease in the money wage rate, equations (1) and (2) guarantee that $d(N_s - N_d) < 0$.

(3b) $N_s < N_d$, then $dW > 0$, with the provision that $(dW/W) > (dP/P)$ so that $d(W/P) > 0$. Equations (1) and (2) then guarantee that $d(N_d - N_s) < 0$.

(3c) $N_s = N_d$, then dW, dP, $d(W/P)$, and $d(N_s - N_d)$ will all be equal to zero.

As we know, the above three equations suffice to determine a unique full employment equilibrium in the labor market. If an aggregate production function is added to this set of equations, then the full employment real output of the system is determined as well. Once the levels of employment and real output have been established in this manner, then Modigliani was able to show that it made no difference whether one utilized the Keynesian "IS-LM" paraphenalia or the classical

"M = kY" paraphenalia to determine the remaining variables of the system such as the price of output, the money wage rate, national income, consumption, saving and investment, and the rate of interest. The reason the paraphenalia employed to solve for the equilibrium values of the remaining variables makes no difference is because once the above three equations are accepted, full employment and capacity output rule, and they rule come what may. In other words, equations (1) through (3) together with an aggregate production function determine the employment and real output of the system independently of whatever set of equations is used to solve for the remaining variables of the model.

II. Keynes's Critique of the Classical Model of Full Employment

It was precisely this three equation model of full employment, and the classical mode of thinking this model so perfectly exemplifies, which Keynes sought to overthrow and replace with a theory capable of explaining the actual levels of employment and real output of the economy. Keynes catalogued his objections to the classical system of thought in Chapter 2 of The General Theory, developed his own theory in Chapters 3 through 21, and took time out in Chapter 19 to argue that a reduction in money wages would have no direct effect on the actual level of employment.

In his Chapter 2 Keynes accepted the first or labor demand function of the classical triad. He then went on

to reject the second or labor supply postulate. However, Keynes was extremely careful to make it clear that he rejected this postulate for practical rather than theoretical reasons. In view of the fact that Keynes produced no compelling objections to this postulate, we shall accept equation (2) as it stands. Finally, and most importantly, Keynes rejected the third postulate of the classical system as being theoretically unsound. It was Keynes's outright rejection of this postulate--the classical vision of the workings of the market mechanism--that enabled him to escape from the full employment fixpoint prison of classical theory. And it was this escape that made it possible for Keynes to develop his own more general theory of employment.

Keynes identified in Chapter 2 what he thought to be the fatal weakness of the classical market clearing equation. To grasp what he had in mind, we refer back to (3a) which states that if involuntary unemployment obtains, then the money wage rate will fall. So far so good, for if money wages are assumed to be flexible, then they must fall whenever labor is involuntarily unemployed. This may not be realistic, but it is logical, and we are here interested in logic, not realism. Continuing on with (3a), this postulate assumes that when the money wage rate falls, the price of output may or may not fall. But if the price of output does fall, then it is assumed that the percentage drop in price will be less than the percentage fall in the money wage rate. However, to assume this much is to say nothing more than that the real wage rate will fall with every fall in the money wage

rate. Given a falling real wage rate, then equations (1) and (2) promise that the economy will move smartly to full employment.

Keynes questioned the validity of the classical line of thought by asking whether a reduction in money wages would in fact cause real wages to fall. I believe the point Keynes was attempting to make is that although it may be legitimate to postulate flexible money wages and prices in a monetary economy,[1] it is less than legitimate to continue on in this vein and make the additional assumption that a falling money wage rate will be followed by a smaller percentage drop in the price of output. The reason this procedure can be judged unsound is because it produces by assumption rather than by analysis the desired conclusion that real wages are flexible with respect to changes in money wages; and this is far too cheap a way to come by so important a conclusion. As Keynes saw it "There may exist no expedient by which labour as a whole can reduce its <u>real</u> wage to a given figure by making revised <u>money</u> bargains with entrepreneurs. This will be our contention. We shall endeavor to show that primarily it is certain other forces which determine the general level of real wages. The attempt to elucidate this problem will be one of our main themes. We shall argue that there has been a fundamental misunderstanding of how in this respect the economy in which we live actually works" [5, p.13].

III. A Keynesian Analysis of Money Wage Reductions

Although Chapter 2 identified the difficulties afflicting the classical theory of employment, it was not until Keynes had erected a considerable theoretical structure of his own that he was able, in Chapter 19, to answer the two part question: "(1) Does a reduction in money-wages have a direct tendency, cet. par., to increase employment, 'cet. par.' being taken to mean that the propensity to consume, the schedule of the marginal efficiency of capital and the rate of interest are the same as before for the community as a whole? And (2) does a reduction in money-wages have a certain or probable tendency to affect employment in a particular direction through its certain or probable repercussions on these three factors?" [5, p.260]. As we know, Keynes concluded that flexible money wages and prices do not imply flexible real wages and so he answered both of these questions in the negative. Indeed, he went so far as to write that "To suppose a flexible wage policy is a right and proper adjunct of a system which on the whole is one of laissez-faire, is the opposite of the truth" [5, p.269].

The fact that today many economists do indeed believe that a system of flexible money wages and prices would suffice to produce full employment suggests that Keynes's analysis of this question has enjoyed much less success than it deserves. Since it is our contention that his argument is correct, we shall now attempt to clarify Keynes's position by recasting his treatment of this problem in terms of the

model of aggregate supply and demand developed in Chapter 3 of The General Theory.[2]

To develop Keynes's model we need the following assumptions:

1. $X = F(N, K_o)$ is the aggregate production function, where N denotes the amount of labor employed, and K_o the given short run stock of capital equipment. It is supposed that F is linear homogeneous with F_N positive and F_{NN} negative.

2. Perfect competition prevails in the commodity market.

3. A given money wage rate, W_1, obtains to begin with. Later on, the money wage rate will be reduced in order to study the effect such a change would have on the equilibrium level of activity.

Under competitive conditions firms will adjust their rates of production until short run marginal cost equals the price of output. Since short run marginal cost is the money wage rate divided by the marginal product of labor, we have the following microeconomic condition.

$$(4) \qquad P = (W_1/F_N).$$

Multiplying both sides of this equation by aggregate output X, yields the corresponding macroeconomic equilibrium condition.

$$(5) \qquad PX = (W_1/F_N)X.$$

The term "$(W_1/F_N)X$" states the total receipts firms in the

aggregate must receive from the sale of output if they are to continue production apace. Using the symbol Y_s to denote these required receipts allows us to write Keynes's aggregate supply function as follows.

$$(6) \qquad Y_s = (W_1/F_N)X.$$

Since F_N is positive and F_{NN} is negative, $Y_s(W_1)$, the graph of the aggregate supply function belonging to W_1, has been drawn concave to the abscissa in Figure 1.

It is to be noted that the function Y_s does not state the actual receipts firms will in fact receive from the sale of output, it merely states the receipts required to sustain any given level of production up to X_f, the full employment output of the system. To determine the actual receipts firms earn from the sale of output, an aggregate demand function is needed.

The aggregate demand function, Y_d, is defined to be a relation between real output, X, and the sum of consumer spending, C, and investment spending, I, measured in dollar terms. We begin by supposing that consumption in real terms, c, is a constant proportion, b, of real output. That is

$$(7) \qquad c = bX, \quad 0 < b < 1.$$

Multiplying the left hand side of (7) by the price of output and the right hand side by its equilibrium equivalent of

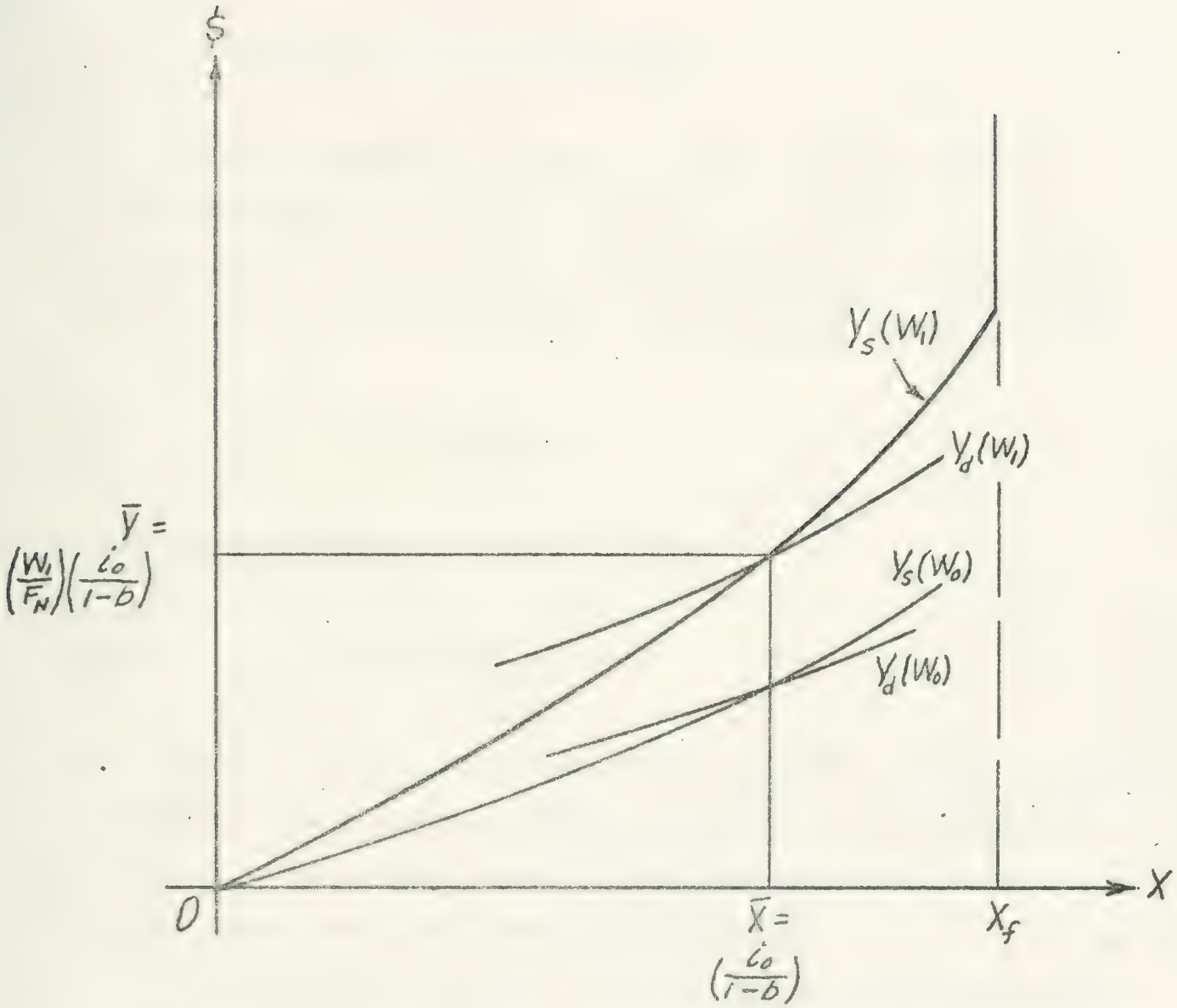
$
$Y_s(W_1)$
$Y_d(W_1)$
$\bar{Y} = \left(\frac{W_1}{F_N}\right)\left(\frac{i_o}{1-b}\right)$
$Y_s(W_0)$
$Y_d(W_0)$
X
0
$\bar{X} = \left(\frac{i_o}{1-b}\right)$
X_f

Figure 1

marginal cost, yields the consumption function in money terms.

$$(8) \qquad Pc = C = b(W_1/F_N)X = bY_s.$$

As for investment spending, it will be assumed that real investment is given at some level i_o.[3] Even so, investment spending in dollar terms will vary with the level of output as marginal cost and price vary with output. Thus

$$(9) \qquad I = Pi_o = (W_1/F_N)i_o.$$

The aggregate demand function is then

$$(10) \qquad Y_d = (W_1/F_N)(i_o + bX).$$

In Figure 1, $Y_d(W_1)$, the graph of the aggregate demand function belonging to W_1, has been drawn concave to the abscissa too. Again, this curvature is due to the fact that the price of output rises along with the level of output.

Equations (6) and (10) together with the condition that supply equals demand determine the equilibrium value of national income $\bar{Y}$ to be $(W_1/F_N)[i_o/(1 - b)]$, and real output $\bar{X}$ to be $[i_o/(1 - b)]$. Figure 1 illustrates this conclusion and shows it to be a typical Keynesian equilibrium of less than full employment; a position in which the commodity market is both in equilibrium and cleared while the labor market, though in equilibrium, is not cleared.

The question now before us is whether the involuntary unemployment associated with the less than capacity level of production $\bar{Y}$ is due, as Modigliani and many others have asserted, to the rigid money wage rate W_1, or whether it is due simply to a lack of effective demand as Keynes would argue. The answer to this question can be found by postulating a once over reduction in the money wage rate and observing the effect this reduction has on the equilibrium level of activity.

In terms of both equation (6) and the diagram, it is clear that a reduction in the money wage rate from W_1 to W_o will produce a downward shift in the aggregate supply function from $Y_s(W_1)$ to $Y_s(W_o)$ as shown in Figure 1. From equation (6) it is calculated that the extent of the shift belonging to any given level of output is

$$(11) \qquad \Delta Y_s = (1/F_N)X\Delta W, \text{ where } \Delta W = W_1 - W_o.$$

Now if the aggregate demand function were to remain in position, then output and employment would rise with every fall in the money wage rate. However, the aggregate demand function does not, cannot, remain in place. The reduction in the money wage rate, and the concomitant fall in the equilibrium price of output from (W_1/F_N) to (W_o/F_N), reduces the flow of income belonging to any given level of output, and so constricts the quantity of finance available to fuel the economy's spending. Inspection of equation (10) shows that the downward shift in the spending function,

from $Y_d(W_1)$ to $Y_d(W_o)$ as displayed in Figure 1, will be

$$(12) \qquad \Delta Y_d = (1/F_N)(i_o + bX)\Delta W.$$

While equation (11) gives the downward shift in the aggregate supply function belonging to $\bar{X}$ to be $(1/F_N)\bar{X}\Delta W$, equation (12) states the the corresponding shift in the demand function to be $(1/F_N)(i_o + b\bar{X})\Delta W$. In view of the fact that $\bar{X}$ equals $(i_o + b\bar{X})$, it is clear that a reduction in the money wage rate will shift the two functions by equal amounts as our diagram shows.

From this analysis it follows that a reduction in the money wage rate will have no direct effect on the equilibrium level of output or the volume of employment. Such a reduction would serve simply to deflate the monetary variables of the economy while leaving the real variables unchanged. This proves Keynes's contention that involuntary unemployment is not due to rigid wages. Rather, involuntary unemployment is due, as The General Theory taught us, to a lack of effective demand. In order for the level of activity to rise, real spending must increase. A change in the numeraire or money wage rate will not by itself generate any direct increase in the volume of real spending.

After demonstrating that involuntary unemployment does not depend on rigid wages and that flexible money wages do not imply flexible real wages, Keynes went on, in Chapter 19, to discuss the possible indirect effects that a falling money wage rate might have on real spending and the level of activity.

After investigating the uncertain impact such reductions might have via the redistribution of real income, the rise in real money balances, the reduction in wage costs relative to those abroad, the effect on entrepreneurial expectations, the increased burden of business debt, etc., Keynes concluded that on balance there is "... no ground for the belief that a flexible wage policy is capable of maintaining full employment" [5, p.267].

Not too many years after The General Theory was published, the Pigou effect[4] was adduced to dispose once and for all "... the Keynesian contention that underemployment equilibrium does not depend on the assumption of wage rigidity" [2, p.119]. Unfortunately for this point of view, Kalecki [4], in an early response to Pigou's work, made it clear that the Pigou effect cannot be used to resuscitate the case for flexible money wages and prices. He did this by pointing out that a deflation of the magnitude required for the Pigou effect to take hold would so disorder the economy as to produce not full employment but social chaos--a state of affairs which neither the classical nor Keynesian systems of thought is capable of analyzing.

IV. Sticky Money Wages are an Essential Property of Money

In addition to the analysis given above in support of the contention that "There may exist no expedient by which labour as a whole can reduce its real wage to a given figure

by making revised money bargains with entrepreneurs," Keynes developed in Chapter 17 of The General Theory a far deeper and theoretically more significant explanation of why freely flexible money wages and prices cannot help produce full employment in a money using economy. In this badly neglected chapter,[5] Keynes advanced the wholly new and difficult to accept proposition that sticky money wages (and hence sticky costs and prices) are an essential property of money. The extraordinary view he put forward in this chapter was that money could not function either as a medium of exchange or a store of value if wage rates, costs of production, and prices were to rise and fall--frequently and unpredictably--in response to the randomly intermittent appearances and disappearances of excess supplies of labor, commodities, and finance that characterize modern economic systems. Since the utility of money "... is solely derived from its exchange value" [5, p.231], the services money provide can be rendered "... only if there is sufficient stability in its purchasing power in buying the goods that it represents" [6, p.383]. Accordingly, throughgoing wage and price flexibility of the type envisaged by many present day economists would destroy a money's purchasing power, and so render it useless to both the buyers and sellers of goods and services and to the lenders and borrowers fo finance. In Lerner's words "Any money which was completely cured of wage and price rigidity would not be able to survive as money" [6, p.385].

The reason a money cannot long survive if its value

is subject to frequent random variations is that such fluctuations would destroy its general acceptability. Why this is so can be seen if we remember that in order of an object to function as money, it must, at base, be capable of discharging claims on demand without imposing a capital loss on either party to a transaction. Thus, sellers will accept money in return for the goods they supply only if the dollars they receive have approximately the same value as the dollars they spent producing output; only if the value of the dollars they earn match the value of the dollars they have spent. Viewed this way, the probability of unpredictable upward movements in the value of money would erode its acceptability simply because such downward turns in prices would make it nigh impossible for even the best managed of firms to cover their recently incurred operating costs out of current receipts. The resulting inability to relate or establish a correspondence between the money value of just suffered operating costs and the money value of current receipts would thereby expose buyers and sellers to random capital losses. The possibility of suffering random capital losses which a system of flexible prices entails would therefore make it extremely hazardous for the public to conduct their economic activities in terms of money; in terms of a money that is unstable at any price.level. Rather than tolerate such a dangerously vagarious money, the public would search for and find, or if necessary invent, a less speculative surer standard of value and medium of exchange. Slowly

or quickly, a stable money would be found that would enable the public to conduct their economic affairs in some rational fashion in the face of the ordinary day to day risks and uncertainties inherent in life.

The possibility of sudden upward movements in the price level would have an equally destructive effect on the acceptability of money. The practice of specifying in money terms the prices of goods and services in advance of their delivery, and in advance of their payment, would expose sellers to the possibility of suffering capital losses. For example, a fall in the purchasing power of money between the time wage rates are agreed upon and labor services delivered, and the time wages are received and income spent, would break the link between the value the market places on labor services at the time wages are determined and the value labor actually receives for its services. In these circumstances, the practice of quoting wage rates in straight money terms would soon be abandoned. More generally, suppliers of goods and services will quote prices, accept payment, and incur obligations in terms of money only if there is some close correspondence between the value of money at the time obligations are made and the time they are satisfied; between the time income is earned and income is received and spent, between the time debts are run up and debts are repaid.

In addition, a money whose value could fall by several percent in the course of a week, and then could fall again, or perhaps rise, depending on the current balance between aggregate supply and demand, would be of little use to

borrowers and lenders alike. Businesses would cease borrowing money to finance capital spending simply because in such circumstances they would not be able to calculate either the direct money costs of their prospective capital projects or the expected yield their spending might return. The link between current capital outlays and prospective yields is highly tenuous under the best of conditions, but if the value of money were subject to erratic change, this already fragile nexus would disappear altogether. Furthermore, few businesses would be willing to issue debt and commit themselves to making fixed money payments whose real value would be a random variable. As for lenders, they would find that stocks, bonds, savings accounts, pension funds, and just plain cash balances would no longer be satisfactory stores of value. In a world where the value of money could flex up and down, money would not be borrowed, lent, or stored--it would not be used. Instead of promoting full employment, overall wage and price flexibility would simply destroy the utility of money.

It has been argued, however, that a flex price system in which all money wages and all prices rise and fall by equal percentage amounts would not impair the utility of money. But surely, no economist who has studied the behavior of individual prices could accept this contention for the obvious reason that it is not possible for all prices to flex simultaneously by equal percentage amounts in any real economy. Lerner saw this clearly when he wrote "Unless we are

to suppose away the whole universe we will have different arrangements in different cases for making the appropriate abrogations of contracts. We will have different degrees of the influence of custom in different parts of the economy. Some prices will therefore fall much more than others. There will be injustice and chaos ... Everything will be in disorder and nothing predictable--except perhaps one thing: that the public will not stand for a continuation of such disturbance and injustice. No matter what else they retain in their social order they certainly will not retain the monetary unit. It will have been rendered quite unfit to do its main job" [6, p.384].

What we have argued is that in order for money to function as a standard of value and a medium of exchange, the value of output as a whole must be sticky in terms of money. But for the value of output to be more or less stable in terms of money, sticky money wage rates are essential. This is because the "money wage-rate is a ubiquitous component of the flow-supply prices of commodities and that labor costs are uniquely related to short-run market prices" [1, p.319], so that "If wages are sticky in terms of money, then the short-run supply price ... of output will ... vary only with the law of diminishing returns in the short-run, and changes in productivity in the long run" [1, p.316]. The money wage rate, then, is the numeraire of the monetary system, and to have a stable numeraire, sticky money wage rates are essential. Sticky wage rates imply sticky costs of production and a relatively stable value of money. With these conditions

holding, wage contracts will be set in terms of money, costs calculated, prices determined, short and long term commitments made, and economic plans drawn up all on the assumption that a generally acceptable money obtains.

We can now better understand Keynes's observation that "To suppose a flexible wage policy is a right and proper adjunct of a system which on the whole is one of laissez-faire, is the opposite of the truth." For some decades our monetary system has been secure from the threat of downward wage and price flexibility, and this has been all to the good. What is not all to the good is the fact that society still remains exposed to the equal danger of rapid upward movements in money wages and prices. Most recently the economy has suffered a six year long inflation arising from the federal government's war spending program. This unhappy experience suggests afresh that if society is to be protected from inflation, means will have to be found to limit both the federal government's willingness and ability to fund and wage large scale socially destructive programs such as the licentious war in Southeast Asia. This will not be easy.

Footnotes

1. The legitimacy of this postulate will be questioned in Section IV below.

2. It is worth emphasizing that the model developed in this section is based on Keynes's General Theory rather than on the now popular IS-LM mechanism Modigliani employed in his 1944 paper. My reasons for not using the IS-LM doctrine are that it bears no significant relation to Keynes's work, and, more importantly, it seems to me to be an internally inconsistent and therefore unhelpful theory of aggregate economic behavior.

3. In a previously published paper [10], the author demonstrated that the rate of investment spending cannot be determined analytically within the confines of a single commodity model. Hence our simple assumption is also the most sensible assumption that can be made.

4. See [8] for a discussion of the Pigou effect.

5. Aside from Lerner [6], Davidson [1], Robinson [9], and Kaldor [3], few economists have taken much interest in this highly important chapter of The General Theory. To account for this lack of attention, Davidson has observed that "Keynes anticipated those 'modern classicists' who aver that a flexible wage and price structure would automatically assure full-employment. Keynes' argument on this is simply devestating--which may explain why so many have chosen to ignor it" [1, p.301].

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